

UNITED STATES PATENT APPLICATION

of

Stephan Bartlett Sears, Jr.

and

Sarah C. Moussa

for

**SYSTEMS AND METHODS FOR
AUTOMATICALLY GENERATING COOKIES**

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WORKMAN, NYDEGGER & SEELEY
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

BACKGROUND OF THE INVENTION

1. The Field of the Invention

The present invention relates to network communications. In particular, the present invention relates to systems and methods for automatically generating network cookies that may be used by network sites to customize services.

2. The Prior State of the Art

The world has greatly benefited by computer networks such as the Internet that allow individuals to access services such as electronic mail, Web site navigation, chat room participation, and instant messaging. Computer systems that offer services are called "servers" while computer systems that obtain services are called "clients." One frequent type of requested service is the downloading of a Web page from a Web site.

When a client sends a request for a service, the server may often like to customize the service using information relevant to the client. For example, if the server offers a weather forecasting Web page, the server might like to know the geographical location of the client so that the Web page might be customized to show the weather forecast for the client's geographical location. The server may find out this information by simply having the user enter the desired information. For example, when navigating to a Web page using a Web browser, the client may display a log-on page that allows the user to enter desired information such as name, address, preferences, and the like in identified fields. Upon logging in, the server would then be able to use this information to customize services.

Requiring that the user enter this information every time they request a service from a network site can be quite cumbersome to the client. Therefore, servers often cause "cookies" to be stored on the client. A "cookie" is information about a client that is

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1 provided by the client to a particular network site when requesting a service from the
2 particular network site. Conventional networking protocols allow for servers to cause such
3 cookies to be stored on the client. When a client subsequently makes a request for a
4 service, the client automatically provides the cookie to the server so as to aid the server in
5 customizing service.

6 Each cookie is specific to a particular server. When accessing a Web site, only the
7 cookie(s) associated with that Web site are provided to the Web site. This is desirable
8 from a security perspective since it prevents renegade Web sites from accessing
9 information about the user that the user did not wish to share with that renegade Web site.
10 One drawback of this, however, is that every time a user visits a Web site that does not
11 have an associated cookie stored on the client, the user might need to re-enter information
12 for the new Web site. This can be quite cumbersome for the user, especially in situations
13 where the security concerns behind automatically providing information to the new Web
14 site do not outweigh the convenience for the user in foregoing the need to manually enter
15 information.

16 For example, the new Web site could be affiliated with a Web site with whom the
17 user has already chosen to share information. Suppose that a user desires to purchase a
18 book but also give special shipping instructions to the shipper. The user had previously
19 navigated to an on-line bookstore and entered relevant information which is now stored on
20 the client in the form of a cookie. Now, upon navigating to the same on-line bookstore
21 Web site, the user does not need to enter the information since the cookie is provided to the
22 on-line bookstore Web site.

23 The user now desires to enter special shipping instructions and thus selects a link
24 entitled "Special Shipping Instructions" which navigates the user to a shipping Web site

1 managed by a shipping company that handles all of the on-line bookstore shipments.
2 Assuming that this is the user's first visit to the shipping Web site, the user would be
3 required to re-enter much of the same information even though the shipping Web site is
4 affiliated with the on-line bookstore and is subject to the same duty of confidentiality as
5 the on-line bookstore.

6 In light of the prior art, it would therefore, be advantageous to provides systems
7 and methods for providing client information to Web sites for which there is no
8 corresponding cookie. It would further be advantageous to provide such client information
9 without burdening the user with entering such client information.
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SUMMARY OF THE INVENTION

A "cookie" is a set of information, such as user information and preferences, used by web sites to present customized web pages to users. Conventionally, such cookies are generated by a server and stored on a client computer system. When the client navigates to a web site, the client browser software checks for locally stored cookies associated with the web site. If a cookie is found, the client transmits the cookie to the server. The server then uses the information from within the cookie to provide customized web pages for the user.

In accordance with the present invention, a "cookie" server automatically generates a cookie for a client. A number of web sites register with a server (hereinafter called a "cookie server") and provide the server with information regarding what data fields are expected in cookies submitted from clients to the web site (hereinafter called "cookie requirement information"). These registered sites are listed in a cookie list provided to the client when the client logs into the cookie server. When a client subsequently initiates a connection to a web site within the cookie list, in addition to checking for any locally stored cookies, the client will indicate to the cookie server that it is connecting to the web site. The cookie server then uses the cookie requirement information for the web site, as well as user specific information, to generate one or more appropriate cookies that the web site may use. The cookie server then transmits the generated cookie(s) to the client. The client may then provide the cookie(s) to the web site so that the web site may provide a customized web page to the client.

The principles of the present invention facilitate numerous advantages over the conventional state of the art. For example, instead of the user having to manually enter information so that the web site may generate cookie(s), the cookie(s) are automatically generated by the cookie server. This allows a user to provide personalization information

In addition, the client need not store the cookie. Instead, the automatically generated cookie for a particular web site may be stored at the cookie server for transmission to the client when the client subsequently navigates to the web site. Even if the cookie is not stored at the cookie server, the cookie server may still regenerate the cookie each time the client navigates to the web site. This latter case also does not require that the client store the cookie. Thus, client memory may be preserved. This is also especially advantageous in devices that have limited memory.

1 Furthermore, the present invention allows the cookie to be more dynamic. For
2 example, a user may have hundreds of associated cookies that are used when navigating to
3 hundreds of different Web sites. If the user moves, for example, the user's address and zip
4 code will change. Conventionally, in order to optimize service at these hundreds of web
5 sites, the user would have to navigate through these web sites, and change the address for
6 each web site, thereby allowing the web site to change the corresponding cookie at the
7 client.

8 The present invention allows the user to change the user information in each of
9 these cookies by simply changing the user information stored at the cookie server. The
10 cookie server would then update all of the corresponding cookies that the server is storing.
11 Alternatively, the user would wait until a subsequent navigation to the web site when the
12 cookie server would generate a cookie with the new user information without requiring
13 further user input. Thus, when the user's information changes, the user need not engage in
14 further data entry as the user navigates to each of the web sites. Instead, the user only
15 changes the user information at the cookie server. This further enhances the unified
16 experience of the user since the user only makes personal information changes once for all
17 associated Web sites thereby giving the impression that the user is dealing with one unified
18 entity.

19 Additional features and advantages of the invention will be set forth in the
20 description which follows, and in part will be obvious from the description, or may be
21 learned by the practice of the invention. The features and advantages of the invention may
22 be realized and obtained by means of the instruments and combinations particularly
23 pointed out in the appended claims. These and other features of the present invention will
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1 become more fully apparent from the following description and appended claims, or may
2 be learned by the practice of the invention as set forth hereinafter.

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BRIEF DESCRIPTION OF THE DRAWINGS

In order to describe the manner in which the above-recited and other advantages and features of the invention can be obtained, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

Figure 1 illustrates a network system in which the present invention may operate;

Figure 2 illustrates the detailed structure of one of the client systems of Figure 1;

Figure 3 schematically illustrates a client/server system in accordance with the present invention; and

Figure 4 is a flow diagram of a method of automatically generating a cookie for use in customizing web pages, in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention extends to both methods and systems for automatically generating cookies for clients. A "cookie" is a set of information, such as user information and preferences, used by web sites to customize information for a user. A number of web sites register with a server (hereinafter called a "cookie server") and provide the server with information regarding what data fields are expected in cookies submitted from clients to the web site (hereinafter called "cookie requirement information"). When a client subsequently prepares to browse to that web site, the client will first check the cookie server for any automatically generated cookies. The cookie server looks up user specific information based on the cookie requirement information for that web site. The cookie server then transmits the relevant information in the form of one or more cookies to the client. The client then transmits the one or more cookies to the web site so that the web site may provide a customized web page for the client.

The embodiments of the present invention may comprise a special purpose or general purpose computer including various computer hardware, as discussed in greater detail below. Set top boxes that enhance the capabilities of conventional televisions represent an example of a special purpose computer. The embodiments may further comprise multiple computers linked in a networked environment.

Embodiments within the scope of the present invention also include computer-readable media for carrying or having computer-executable instructions or data structures stored thereon. Such computer-readable media can be any available media that can be accessed by a general purpose or special purpose computer. By way of example, and not limitation, such computer-readable media can comprise physical storage media such as RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or

1 other magnetic storage devices, or any other medium that can be used to carry or store
2 desired program code means in the form of computer-executable instructions or data
3 structures and that can be accessed by a general purpose or special purpose computer.

4 When information is transferred or provided over a network or another
5 communications connection (either hardwired, wireless, or a combination of hardwired or
6 wireless) to a computer, the computer properly views the connection as a computer-
7 readable medium. Thus, such a connection is also properly termed a computer-readable
8 medium. Combinations of the above should also be included within the scope of
9 computer-readable media. Computer-executable instructions comprise, for example,
10 instructions and data which cause a general purpose computer, special purpose computer,
11 or special purpose processing device to perform a certain function or group of functions.

12 The invention will be described in the general context of computer-executable
13 instructions, such as program modules, being executed by set-top boxes or other
14 computers. Generally, program modules include routines, programs, objects, components,
15 data structures, etc. that perform particular tasks or implement particular abstract data
16 types. Computer-executable instructions, associated data structures, and program modules
17 represent examples of the program code means for executing steps of the methods
18 disclosed herein. The particular sequence of such executable instructions or associated
19 data structures represents examples of corresponding acts for implementing the functions
20 described in such steps.

21 The present invention may be implemented in any computer network environment
22 that facilitates network navigation to web sites. For example, computing devices such as
23 desk-top computers, lap-top computers, Personal Digital Assistants (PDAs), wireless
24 telephones, set top boxes and the like may execute thereon web site navigation software

1 which allows for information such as web pages to be downloaded from web sites through
2 a logical connection with the web site.

3 Figure 1 illustrates a basic configuration of a network 100 in which the present
4 invention may be implemented. A number of clients 101 are coupled to the Internet 103.
5 This connection may be direct bi-directional data connections 107 which may be, for
6 example, cable RF lines. Alternatively, the connection may be via a modem pool 102
7 using direct-dial, bi-directional data connections 106, which may be telephone (POTS, i.e.,
8 "plain old telephone service"), ISDN (Integrated Services Digital Network), or any other
9 similar type of connection. The modem pool 102 is coupled typically through a router,
10 such as that conventionally known in the art, to a number of remote servers 104 via a
11 conventional network infrastructure 103, such as the Internet.

12 Figure 2 illustrates a client 101 in further detail. The client 101 may facilitate
13 television viewing in addition to web site navigation. While it is the web site navigation
14 functionality of the client that is primarily involved with implementing the present
15 invention, all of the primary elements of the client 101 will now be described for
16 completeness, regardless of whether those elements contribute to web site navigation or
17 television programming viewing.

18 The client 101 includes a display device 214 and an audio system 216. The display
19 device, which may be a high definition television display, a standard television display, a
20 flat panel display, a projection device, a high definition television display, a computer
21 monitor, or any other device capable of displaying images or video represented by image
22 or video data. Audio system 216 may be a speaker, a stereo system, or any device capable
23 of presenting sound represented by sound data.

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1 The client 101 also includes a management system 212, which may be a set-top box
2 or other component that has been adapted to facilitate web browsing and television
3 viewing using the display device 214 and audio system 216. Management system 212 may
4 be integrally positioned with or separate from display device 214 and/or audio system 216.

5 Management system 212 includes a signal input 218, which receives programming
6 from a signal source 220. The programming is transmitted from signal source 220 to
7 signal input 218 via a programming input line 222, which can be a cable or optic
8 connection, a terrestrial antenna system, a satellite system, or any device or system capable
9 of transmitting programming to home management system 212.

10 The management system 212 also may include a cable modem 278 which may
11 receive data, such as a Web page, from a remote server 260 (e.g., one or remote servers
12 104 of Figure 1), where the data has been appropriately routed through signal source 220
13 to the programming input line 222. The cable modem 278 may also provide data over the
14 programming input line 222, back to the signal source 220 for appropriate routing to the
15 remote server 260. Thus, the programming input line 222 may act as the bi-directional
16 data connection 107 described above with respect to Figure 1. In this example, the signal
17 source 220 would be a cable company head end that has a dedicated connection with the
18 Internet. This communication may use the DOCSIS, DAVIC, or other communication
19 standards to establish the communication link over a standard RF cable.

20 While Figure 2 illustrates the client 101 as having a single programming input line
21 222 and a single signal source 220, there can instead be a plurality of programming input
22 lines that transmit programming from a plurality of signal sources. In such embodiments,
23 the client may receive the programming from one signal source or from a plurality of
24 signal sources at a time.

1 Management system 212 also includes a user input interface 224, which receives
2 input from an input device 226, such as a remote control, keyboard, microphone, or any
3 other device capable of generating electronic instructions for management system 212.
4 Input device 226 is communicatively coupled to management system 212 over an input
5 link 228 so as to enable such control. Input device 226 generates electronic instructions
6 over input link 228 in response to preprogrammed data or in response to a viewer pressing
7 buttons on input device 226. Input device 226 may also control web browser software
8 within management system 212 as when management system 212 is a set-top box or an
9 Internet terminal that has been adapted to perform web browsing as described herein. For
10 instance, input device 226 may be programmed to turn on client 101 and to tune
11 management system 212 to a channel.

12 Figure 2 illustrates a signal recorder 230, which is capable of receiving video
13 and/or audio data and recording the data on a storage medium. Video signals are
14 transmitted to signal recorder 230 and/or display device 214 by video image link 232,
15 examples of which include a radio-frequency ("RF") link, an S-video link, a composite
16 link, or any other equivalent form of video image link. Similarly, audio link 234 transmits
17 audio data from the client 101 to audio system 216 or to signal recorder 230.

18 The operation of the management system 212 is controlled by a central processing
19 unit ("CPU"), illustrated as processing unit 236, which is coupled to an application-
20 specific integrated circuit ("ASIC") 238 and uses computer-executable instructions
21 implemented in software and/or hardwired logic circuitry. Processing unit 236 and ASIC
22 238 are coupled via a system bus 240, which also interconnects various other system
23 components, such as the system memory 242, mass storage interface 244, user interface
24 224 and signal input 218. Processing unit 236 executes software designed to implement

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1 features of management system 212 including features of the present invention. ASIC 238
2 contains circuitry that is used to implement certain functions of management system 212.
3 Instructions, data, and other software necessary for the operation of processing unit 236
4 and ASIC 238 may be stored in the system memory 242, such as in read-only memory
5 ("ROM") 246 and/or in random-access memory ("RAM") 248, and/or in a mass storage
6 device 250, which is coupled to mass storage interface 244. ROM 246, RAM 248 and
7 mass storage device 250 are communicatively coupled to ASIC 238 so as to be readable by
8 ASIC 238 and so that data may be written from ASIC 238 to RAM 248 and possibly mass
9 storage device 250.

10 Mass storage device 250 may be a magnetic hard disk 252 or any other magnetic or
11 optical mass memory device that is capable of storing large amounts of data. Any desired
12 computer-readable instructions or data, including application programs 254, other program
13 modules 256, and an Electronic Programming Guide ("EPG") 258, which specifies the
14 broadcast times and channels of programs can be stored in mass storage device 250. Mass
15 storage device 250 can also be used to record video data 253, in which case, management
16 system 212 operates as a digital video recorder.

17 EPG data may be obtained in a variety of manners. For instance, the EPG data can
18 be supplied to management system 212 by a remote computer 260, such as a server, and
19 stored on mass storage device 250. The EPG data is supplied on a regular basis to
20 continually maintain a current schedule of programming at the management system 212.
21 Where home entertainment system 212 is associated with the Internet, the data included in
22 the EPG may be downloaded from the Internet. Alternatively, the EPG may delivered to
23 the home entertainment system by using a direct-dial communication over standard
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1 telephone lines, or by using data transmission over the cable television infrastructure, a
2 satellite network, an over-the-air broadcasting or any other available medium.

3 As described above with reference to Figure 1, the client 101 may also
4 communicate with remote servers 104 using a connection 106 to a modem pool 102. This
5 communication may occur by the management system 212 communicating with the remote
6 computers 260 over a network such as wide area network 262. Communication over a
7 wide area network is facilitated by a serial port interface 264 that is interposed between the
8 system bus 240 and a modem 266, a wireless link, or other means for establishing
9 communications over a WAN that may be internal or external to management system 212.
10 Management device 212 is also capable of transmitting information via the network (e.g.,
11 the Internet) by direct-dial communication over standard telephone lines, or by using any
12 other available communication medium as described above with reference to Figure 1.

13 While serial port interface 264 may be utilized to connect a modem 266 for
14 communicating across a WAN, serial port interface may also be utilized to connect other
15 consumer electronic devices, such as video game 268, and/or various input devices, such
16 as a keyboard (not shown) or joystick (not shown), to the management system 212.

17 Referring now to signal input 218, if the signal on programming input line 222
18 includes multiple channels, a tuner 270 included in signal input 218 tunes to a selected
19 channel in the signal. Multiple tuners 270 can be used to provide enhanced viewing
20 features, such as picture-in-picture (PIP), recording one channel while viewing another,
21 and recording a plurality of channels simultaneously. A signal decoder 272 converts video
22 data from an analog format to a digital format, or from a digital format to an analog format,
23 in the event that ASIC 238 and tuner 270 employ different formats. Video decoder 272
24 also decodes video data from a compressed video format (e.g. MPEG). In embodiments

1 where the management system 212 includes multiple tuners 270, the management system
2 212 may also include multiple signal decoders 272 to perform the operations disclosed
3 herein.

4 The management system 212 also includes a video output 274, which may include
5 a video encoder and/or a video converter. The video encoder assigns a code to frames of
6 video data that are transmitted across a video image link 232 and switches between analog
7 and digital formats as necessary. Similarly, audio output 276 can include an audio
8 converter to provide the necessary switching between analog and digital formats.

9 While Figure 2 and the corresponding discussion above provide a general
10 description of a suitable environment in which the invention may be implemented, it will
11 be appreciated that the features of the present invention disclosed herein may be practiced
12 in association with a variety of different system configurations. In particular, as described
13 herein, the principles of the present invention are particularly advantageous where client
14 have limited memory capacity and limited input means. Therefore, while the principles of
15 the present invention will be advantageous in all types of web browsing environment, they
16 may be especially useful when using telephones, Personal Digital Assistants or other
17 limited input and memory devices when browsing web sites.

18 Having described an environment in which the present invention may be
19 implemented with reference to Figure 1 and Figure 2, the operation of embodiments of the
20 present invention will now be described in further detail with respect to Figure 3 and
21 Figure 4. Figure 3 illustrates a client/server architecture 300 in accordance with the
22 present invention. When a client 320 is to connect with a web site such as weather web
23 site 330 or news web site 340, the cookie server 310 provides the appropriate cookie or
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1 cookies for that web site to the client 320. The client 320 then provides that cookie(s) to
2 the web site so that the web site may provide a customized page to the client 320.

3 The detailed operation and the remaining features of the client/server architecture
4 of Figure 3 will be described with respect to Figure 4, which illustrates a flowchart of a
5 method 400 of the server generating cookies and the client using those cookies so that web
6 sites may provide customized pages to the client. In this method, steps and acts performed
7 by the cookie server are listed in the left hand column under the heading "COOKIE
8 SERVER" while those steps and acts performed by the client are listed in the right hand
9 column under the heading "CLIENT".

10 Once the client logs into the cookie server (act 401), the cookie server then uses
11 information specific to the client (or user thereof) to generate a cookie or cookies tailored
12 to the information required by a web site that the client is to access. Accordingly,
13 embodiments within the scope of the present invention include a means and step for using
14 client information to generate one or more cookies tailored to the information required by a
15 web site that the client is to access (step 402). The means for performing this function is
16 illustrated in Figure 3 as cookie server 310, although any hardware or software or
17 hardware/software combination that accomplishes the function will suffice. The step for
18 performing this function is illustrated in Figure 4 as corresponding acts 403, 408, 409 and
19 410, although any acts that accomplish the step will suffice.

20 In act 403, the cookie server transmits (act 403) a cookie list to the client, which
21 then receives the cookie list (act 405). Receiving the cookie list is the first act in a series of
22 corresponding acts that the client performs in accomplishing a step for assisting the server
23 so that if the client is to access a particular web site, the server transmits to the client a
24 cookie associated with the web site (step 404). As evident from Figure 3, the cookie list

370 includes entries associated with web sites that have provided cookie requirement information to the cookie server.

Also included in the step for assisting the server (step 404) is an act of, when accessing a particular web site, determining that the particular web site is associated with an entry in the cookie list (act 406). The browser software associated with the client may be configured to consult the cookie list each time the browser software is to issue a request for a page from a web site to verify whether or not that web site is included in the cookie list. If the web site is included in the cookie list, then the client requests the corresponding cookie or cookies from the web site (act 407), thus completing the step for assisting the server (step 404).

The cookie server then accesses cookie requirement information 360 corresponding to the web site (act 408). For example, suppose the client was to access the weather web site 330, the corresponding cookie requirements might require the zip code (see cookie requirement information 360 in Figure 3) thereby allowing the weather web site to provide a weather forecast specific to the user's zip code. The cookie requirement might also require the language of the user thereby tailoring the web page to the language of the user. The gender of the user may also be useful to properly address the user as "Mr." or "Ms." The cookie requirements for a news web site might require the last name of the user so that the web site can properly address the user, the user gender, the user language, and the user interests so that news related to items of particular interest may be presented to the user.

The cookie server then generates one or more cookies based on the cookie requirement information and user information (e.g., user information 350) corresponding to the user (act 409). In other words, for each item of the cookie requirement information, the cookie server would gather the relevant user information and forward that information

1 back to the client 320. For each piece of information, the cookie server will send the name
2 of the item (i.e. zip code, language, gender, etc.) along with the specified user's relevant
3 information (54321, English, male, etc.).

4 For example, suppose that the client is to access the weather web site 330, and that
5 the user logged onto the cookie server as user A. The cookie server 310 would refer to the
6 cookie requirement information for the weather web site to determine that the zip code of
7 the user is needed. Referring to user A's information in user information 350 of Figure 3,
8 the cookie server 310 would generate a cookie that includes "54321" as the "zip code".
9 The cookie requirement information also requires a language of the user to be chosen
10 between English and Spanish. The user information indicates that the user's primary
11 language is English and that the user reads a second language, German. The cookie server
12 310 would then generate a cookie that includes "English" as the "language". The cookie
13 requirement information also requires a gender. Thus, the cookie server 310 would
14 generate a cookie that includes "male" as the "gender". The resulting cookies are then
15 transmitted back to the client (act 410) thus completing the step for using the client
16 information to generate one or more cookies (step 402). The client then receives the
17 generated cookie(s) (act 411) and supplies the cookie(s) to the web site (act 412) so that the
18 web site may provide a customized page to the client (act 413).

19 Note that the cookie server 310 generates a cookie for each item of the cookie
20 requirement information. Alternatively, the cookie server 310 might combine multiple
21 items of the cookie requirement information into a single cookie using a cookie assembler
22 380. For example, when the user initiates a connection to the weather web site 330, the
23 cookie assembler may generate a cookie that includes all of the relevant user information
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1 such as zip code, language, and gender. The cookie server would then transmit that single
2 cookie back to the client 320.

3 Typically, when accessing a web site for the first time, the web site will prompt the
4 user to enter user specific information that may be used to customize pages provided to the
5 user. The web site then typically stores the user information in one or more cookies and
6 has the client store the cookie(s). When the client subsequently navigates to the web site,
7 the client browser software conventionally provides the cookie(s) to the web site so that
8 the web site can provide customized web pages to the client. However, when accessing a
9 different Web site, the user would typically need to reenter user information for that
10 different Web site, even if the two Web sites are closely affiliated.

11 For example, suppose that a user desires to order a book from an on-line book store
12 Web site. The user would be required to enter user information relevant to the purchase.
13 The user might then select a "Special Shipping Instructions" link which navigates the user
14 to the association shipping web site. Conventional methods often require that the user
15 once again enter for the shipping Web site much of the same user information that was
16 entered for the on-line bookstore Web site. The present invention, however, permits the
17 user to enter this user information once, and allows that user information to be shared with
18 other affiliated sites. Thus, the user appears to be dealing with one unified entity from the
19 standpoint of having to enter personal information when, in fact, there may be several
20 affiliated on-line entities with which the user is communicating. This provides the user
21 with a single unified experience when accessing affiliated Web sites.

22 The present invention is especially advantageous when user input is made more
23 difficult by the limitation in smaller navigation devices such as wireless telephones and
24 Personal Digital Assistants (PDAs). Instead of needing to enter customization information

1 at multiple sites using a limited user interface, the user can enter that information once and
2 then, when visiting affiliated sites, the user will not need to re-enter the information, even
3 when visiting a site for the first time.

4 In addition, although the resulting cookie generated by the cookie server may be
5 stored at the client for subsequent navigation to the web site, this is not necessary. The
6 cookie server may store the cookie and or automatically generate the cookie each time the
7 user navigates to the web site. This eliminates the former requirement that the client itself
8 store the cookie. This may be especially useful in devices that have limited memory such
9 as, for example, mobile telephones and PDAs.

10 In addition, the present invention allows the cookie to be more dynamic. For
11 example, a user may have hundreds of associated cookies that are used when navigating to
12 hundreds of different Web sites. If the user moves, for example, the user's address and zip
13 code will change. Conventionally, in order to optimize service at these hundreds of web
14 sites, the user would have to navigate through these web sites, and change the address for
15 each web site, thereby allowing the web site to change the corresponding cookie at the
16 client. The present invention allows the user to change the user information in each of
17 these cookies by simply changing the user information stored at the cookie server. The
18 cookie server would then update all of the corresponding cookies that the server is storing.
19 Alternatively, the update would be postponed until a subsequent navigation to the web site
20 when the cookie server would generate a cookie with the new user information without
21 requiring further user input. Thus, when the user's information changes, the user need not
22 engage in further data entry as the user navigates to each of the web sites. Instead, the user
23 only changes the user information at the cookie server. This enhances the unified
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